

Serial No. 10/654,963

BEST AVAILABLE COPY

LISTING OF CLAIMS:

1. (Currently amended) An automobile wiper driving apparatus comprising:

a DC motor driven by a DC power supply for ~~sweeping repeatedly moving a wiper from~~  
between a prescribed park position to and a maximum wiping position; and

wiper driving controlling means for switching on and off by a pulse width modulation  
~~signal of which duty corresponds to an externally fixed operation speed a switching element~~  
~~provided on a current rout between said DC power supply and DC motor which is driven at a~~  
~~rotation speed which corresponds to said externally fixed operation speed~~  
receiving a signal  
indicating an inputted operation speed of said wiper and controlling said wiper to move at the  
inputted operation speed by driving said DC motor at a rotation speed which corresponds to the  
inputted operation speed.

wherein said wiper and wiper ~~driving controlling~~ means are assembled in a module, and  
said wiper controlling means comprises:

a switching element, provided on a current route between said DC power supply and said  
DC motor, receiving a pulse width modulation signal having a duty which corresponds to the  
inputted operation speed, performing a switching on and off operation responsive to the pulse  
width modulation signal so as to drive said DC motor at the rotation speed, and controlling said  
wiper to move at the inputted operation speed; and

a relay, connected in parallel with said switching element, for switching on to move said  
wiper at a predetermined operation speed regardless of states of said switching element, when  
the inputted operation speed is equal to the predetermined operation speed.

## BEST AVAILABLE COPY

Serial No. 10/654,963

2. (Original) The automobile wiper driving apparatus according to claim 1, wherein said switching element is a power MOSFET which is provided on a current route between said DC motor and a cathode of said DC power supply.

3. (Currently amended) The automobile wiper driving apparatus according to claim 1, which further comprises a rotation speed detection means for detecting a rotation speed of said DC motor,

wherein said ~~wiper driving means~~ wiper controlling means compensates said duty whereby said rotation speed corresponds to said ~~externally fixed~~ inputted operation speed.

4. (Currently amended) The automobile wiper driving apparatus according to claim 1, which further comprises a current detection means for detecting a motor current through said motor,

wherein said wiper driving means compensates said duty whereby said motor current corresponds to said ~~externally fixed~~ inputted operation speed.

5. (Currently amended) The automobile wiper driving apparatus according to claim 1, wherein said wiper ~~driving~~ controlling means set up said pulse width modulation signal in such a manner that a duty during said wiper's moving from said maximum wiping position to said park position is greater than a duty during said wiper's moving from said park position to said maximum wiping position.

6. (Currently amended) The automobile wiper driving apparatus according to claim 1, wherein said wiper ~~driving~~ controlling means further comprises:

a timer for counting a wiper descent time period T1; and

**BEST AVAILABLE COPY**

Serial No. 10/654,963

another timer for counting a wiper ascent time period T2,  
wherein said wiper ~~driving~~ controlling means set up said duty of said pulse width  
modulation signal in such a manner that a difference between T1 and T2 is within a prescribed  
period.

7. (Canceled)

8. (New) The automobile wiper driving apparatus according to claim 1, wherein the predetermined operation speed indicates movement of said wiper at a high speed mode, and said wiper is moved by said DC motor at a high speed while a driving current passes through said DC power supply, said DC motor and said relay switched on, when the inputted operation speed is equal to the predetermined operation speed.

9. (New) The automobile wiper driving apparatus according to claim 1, wherein said wiper controlling means monitors a rainfall detection signal and controls the DC motor responsive to the rainfall detection signal.

10. (New) The automobile wiper driving apparatus according to claim 1, wherein said DC motor is a two brush DC motor.

11. (New) The automobile wiper driving apparatus according to claim 1, wherein said wiper controlling means further comprises a microcomputer, the microcomputer being configured to facilitate measuring a time difference between a descent of the wiper and an ascent of the wiper,

<sup>P. 7</sup>  
**BEST AVAILABLE COPY**

Serial No. 10/654,963

and changing the duty during the ascent or and descent so that the time difference is within a prescribed tolerance.